

Comprehensive and Strategic Plans for Public Transportation

King County Metro Transit Service and Facility Guidelines

Many public transit agencies establish guidelines or standards to guide transit service and facility development. Guidelines are intended to help agencies design and provide quality service in a productive and efficient manner. This paper serves as a review of Metro's current sources of guidance, touches upon considerations for development of service and facility guidelines and surveys practices of other agencies. It highlights ideas and points of discussion related to development of a service guidelines system in the context of the update to the Strategic and Comprehensive plans.

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Purpose of Transit Guidelines and Standards

Many public transit agencies implement guidelines and standards to guide transit service development, design and provision. Service design guidelines identify methods, procedures, and criteria for designing, evaluating, and adjusting the performance of fixed-route and demand-responsive public transit services. They act as tools for maximizing the overall usefulness of the public transportation system for customers, ensuring the consistency of the route structure, and providing consistent criteria for establishment of service levels.

Guidelines differ from standards in that guidelines tend to be more flexible in nature. A standard on the other hand is a more firm measure used as a basis for judgment or comparison¹.

Guiding Factors for Metro Service and Facility Development

King County Metro guidance for service and facility development comes from many sources including Metro's Ten Year- Strategic Plan and Comprehensive Plan for Public Transportation, historical agency guidelines, published industry best practices and application of professional knowledge and judgment. For the purposes of this discussion, service and facility guidelines and

¹ National Committee on Urban Transportation. Recommended Standards, Warrants, and Objective for Transit Service and Facilities: A Procedural Manual. 1958.

standards are considered for those elements of Metro's system which are not already specifically guided by federal, state or local laws or regulations, which themselves may direct or define Metro services.

Metro has at different points in time identified service guidelines to provide direction for tracking performance, evaluating service changes and identifying services not meeting the desired levels of performance as well as identifying design guidelines for facility development. Given the evolution of Metro's transit system and the ongoing evolution of best practices across the transit industry, some previously-identified guidelines are no longer relevant. Consequently, there is no one document that Metro points to as the basis for service and facility development decisions but rather decision-making rests upon a variety of sources. These sources include planner knowledge and experience, adaptations of previously identified guidelines, national research by industry experts such as the Transportation Research Board, and review of service and facility guidelines used by other agencies. The Ten-Year Strategic Plan and the Comprehensive Plan for Public Transportation include policies and strategies that guide service and facility development in both specific and general ways.

Examples of Service and Facility Guidelines

There are certain guidelines that Metro uses regularly and which affect various aspects of Metro's service design, delivery and system management investments. Some guidelines suggest best practices for service design, methods of evaluating service quality or to identify thresholds at which service or facility investments should be made. For example:

- *Service Quality – Overloads:* A route is defined as overloaded when it is at or above 1.3 capacity or at 1.2 capacity with passengers standing for 20 minutes or longer
- *Service Quality – Schedule adherence:* A route is defined as on-time if it is up to 5 minutes late or 1 minute early. Metro targets to achieve an 80 percent on-time rate.
- *Service Design – Deviation:* Routings should only deviate from a more direct pathway than where the number of riders boarding/alighting on deviation is offsets the number of minutes lost for through riders.
- *Facility Investment – Threshold for installation of a shelter:* 50 or more riders per day in Seattle, 25 or more outside of Seattle.

General service planning principles and samples of service guidelines to help document the basis for decision-making is included in Appendix A.

Service Evaluation Guidelines

Metro has established service evaluation guidelines for regular assessment of the performance of all routes. The evaluation process is intended to provide clear, consistent information about the performance of individual transit services to aid planners and decision-makers in developing service changes. The intent of the process was to identify very successful services as well as unsuccessful ones, utilize simple evaluation criteria to improve the consistency of use, and define performance thresholds that reflect unique performance aspects of different markets and types of service.

The service evaluation guidelines are applied in the annual Route Performance Report, which assesses service performance of all regular service. Performance assessment is based on comparison to other members of the same group of routes and routes are grouped by subarea and time period for similarity in operating conditions. Thresholds for “strong” and “below average” performance are determined for each subarea and time-period group, based on average route performance in each group.

The Route Performance report focuses on four measures: riders per revenue hour, fare revenue to operating expense ratio, passenger miles per revenue hour and passenger miles divided by platform miles.

Principles for Developing New Guidelines and Measures

General principles identified as part of Metro’s service evaluation update process in 1996 state that guidelines should:

- 1) Be simple to use and understand by a wide audience
- 2) Rely on criteria that are measurable and methods that are quantifiable to ensure consistent application over time
- 3) Require all services to meet minimum expectations at some point so that limited public resources can be responsibly and efficiently targeted
- 4) Clearly delineate actions stemming from both poor and strong performance
- 5) Provide more than one chance for a service to demonstrate performance but limit the amount of time a service has to perform before resources are reallocated (i.e. poor performers cannot continue forever)

Published Industry Research and Best Practices

Published research is a valuable source of information and guidance, for both service design and facility design. Some of the specific documents used by Metro include:

- Transportation Research Board (TRB) Transit Cooperative Research Program (TCRP) *Transit Capacity and Service Quality Manual*
- Transportation Research Board (TRB) Transit Cooperative Research Program (TCRP) Report 95: Chapter 9: *Transit Scheduling and Frequency*
- Transportation Research Board (TRB) Transit Cooperative Research Program (TCRP) Report 95: Chapter 10: *Bus Routing and Coverage*.
- Transportation Research Board (TRB) Transit Cooperative Research Program (TCRP) Report 90: *Bus Rapid Transit, Volume 2: Implementation guidelines*

Other Agency Guidelines, Standards and Practices

Additionally, planners often review practices of other agencies. Appendix B includes a more detailed description of some of the other agency guidelines currently in use.

Overview of Possible Factors Addressed By Guidelines

Service and facility guidelines can play a role in helping an agency meet its goals and objectives by providing flexible performance targets. Therefore, it is important that an agency select guidelines that correspond with their performance goals and targets.

This section is designed to provide an overview of quality of service measures and guidelines included in the TCRP Transit Capacity and Quality of Service Manual and a briefing of current service guideline practices of other transit agencies.

Land Use

Land use affects the level and nature of travel demand, and therefore influences transit service levels. Where employment centers and high density development exist, there is a greater opportunity for a greater transit market, given that other attributes present in the area are transit-supportive. On the national scale, a ten percent increase in population density has been shown to correspond with a five percent increase in transit boardings².

King County Metro serves a mix of areas including suburban neighborhoods and regional centers. Residential densities in East and South King County are on average lower than those of the North King County, especially when compared to the highest density neighborhoods of Seattle. The higher density areas in the east and south King County range from roughly 4.3 to 6.5 housing units an acre, with a few pockets such as downtown Bellevue approaching 10 units per acre according to estimates by the Puget Sound Regional Council. By contrast, in areas such as the University District, Downtown Seattle and Capitol Hill, housing unit density ranges from 10 to 50 units per acre. These differences offer unique challenges to transit service that affects decisions made about service frequency and service coverage. Areas with low-densities such as suburban neighborhoods tend to have express bus service to central business districts or park and ride services with service frequencies between 30 and 60 minutes. More dense areas offer more frequent services, between 5 to 20 minutes between transit vehicles. Land use and development patterns also affect accessibility to transit. To make transit service more attractive and to enhance service levels, areas served with transit service must also provide accessibility to pedestrians.

Access to Transit

Access to a transit stop or transit center is a critical point in connecting citizens with transit service. Best practices suggest that a quarter mile is the farthest transit agencies should expect passengers to walk to buses and that distance is doubled to a one-half mile for light rail³. King County Metro attempts to locate bus stops so that customers walk no more than a quarter of a mile to access a bus stop. Some studies have found though, that a higher portion of riders walk farther than one-half of a mile to transit and some rail passengers walk as far as a mile in some cases⁴. There are multiple components to transit accessibility that include not only walking distance, but factors such as street design and pedestrian pathways.

² Tumlin, Jeffrey, et al. How to make transit-oriented development work.

³ Kittleson, et al. Transit Capacity & Quality of Service Manual, 2nd edition (TCRP Report 100). Washington, D.C: Transportation research board.

⁴ Weinstein, A. et al. How far, which route and why? Spatial analysis of pedestrian preference. Washington D.C: Transportation Research Board Annual Meeting 2007/.

Street designs, pedestrian crossings, weather and topography also affect pedestrian accessibility and willingness to walk. When streets are designed to provide more direct access for pedestrians to transit routes and neighborhood amenities, this may encourage more people to travel via alternative modes. Wide and busy street can discourage pedestrian travel, so the provision of signalized crossings in such areas makes pedestrian travel friendlier. The difficulty pedestrians have crossing the street can be expressed by the amount of delay they experience when crossing the street. Pedestrians become impatient when their wait exceeds 30 seconds and display risk-taking behaviors such as jay-walking or running across the street. For transit providers, locating transit stops where there are designated pedestrian crossings and adequate pedestrian amenities can help encourage further use of the transit system. TCRP's *Manual* suggests pedestrian access be measured through pedestrian level of service (LOS), which could be measured by determining traffic volumes, facility type, and amount of separation between pedestrians and traffic in the vicinity of a transit stop.

Service Quality Factors

Aside from factors that affect actual service provision, there are additional components of service that impact service quality and ultimately, transit system performance. These areas including service frequency, on-time performance and travel time can serve as both performance measurements and service guideline areas for transit agencies to consider.

Service Frequency

Service frequency is important to attracting more transit riders. Service frequency determines how often a user can access the transit mode available, provided it is during the time and destined for the place the user wishes to travel. TCRP Report 100 identifies average headway was the commonly used service measure for frequency. With more frequent service, transit users have more flexibility in selecting travel times and shorter waits when a bus is missed or the schedule is unknown. Increased service frequencies can make transit a more attractive form of travel. Many transit agencies have implemented policy headways, which specify the frequency in minutes that a type of transit service operates. Policy headways are considered a guideline that provides a minimum requirement for different types of service including express, local and commuter services.

On-Time Performance

On-time performance is the commonly used measure for service reliability, which is tied to service frequency. If the service is scheduled for arrival every 20 minutes, but arrives late, it impacts both the frequency and reliability of the service. King County Metro employs on-time performance as a measure to manage transit route performance. The TCRP Manual identifies "on-time" as a vehicle being 0 to 5 minutes late, with early departures not considered to be on-time. Transit vehicles running early can be a significant contributor to low on-time performance. On-time performance is particularly valuable to measure vehicles with less frequent service while headway adherence may be a better measure to determine reliability on transit service operating at headways of 10 minutes or less. Headways are an important guideline in service reliability because vehicles that do not adhere to headways can cause longer wait times for passengers and a stacking of transit vehicles, leading to a decline in the efficiency of the service.

Travel Times

Travel times for commuters are also a consideration in thinking about service guidelines. Total trip time for transit users includes travel time to the transit stop, wait time for the transit vehicle, on-board travel time and any additional transfer or walking time to their final destination.

Passengers perceive travel times differently during portions of their trip. Travelers tend to value waiting and walking time to transit higher than in-vehicle time⁵. Transfers further impose a perceived cost on riders. From the perception of a transit user, transfer wait time costs tend to be greatest during the first few minutes and decline as waiting duration increases⁶. When passengers have to transfer, it is estimated that the penalty is 5-15 minutes of in-vehicle time. There are means to reduce perceived travel times through increased comfort, improvements in walking conditions, reduced waiting times and increases in speed and reliability of a service.

Passenger Loads

Transit can become less attractive for passengers when they encounter crowded vehicles. Crowded transit vehicles can deter users while also slowing down transit operations. The degree of passenger crowding, can be measured by load factor. King County Metro regularly monitors the load factor on route trips through available data and with a load factor of 1.0, meaning that there are an equal number of seats and passengers on that trip at its maximum load point. Passenger loads and service frequencies interact, with higher boarding volumes and higher frequency, passengers can be assured that their waiting time will be minimal for the next bus.

Other Agency Use of Guidelines

To assess how Metro compares and understand what other agencies do, a literature review and review of plans from agencies was conducted. The agencies where service guideline documents were available for review included Vancouver TransLink, TriMet of Portland Oregon, Sound Transit and Denver's Regional Transit District (RTD). The review looked at service guidelines and service evaluation. Highlights are identified below with a more detailed discussion included in the Appendix C.

Highlights

This review found that many agencies use guidelines as part of the tracking and evaluation process and that the guidelines often reflect different types of service. Some key observations include:

- **Tie Between Guidelines and Performance Measures** - Many agencies develop guidelines to help guide and evaluate service. Denver identified standards rather than guidelines. There

⁵ Litman, Todd. Valuing Transit Quality Service Improvements.

⁶ IBID.

tends to be a close linkage between service standards or guidelines, and agency performance measures.

- **Guidelines as One Component of an Evaluation System** – Established guidelines were identified as one component of an evaluation system which set expectations for route or system performance, but were not used in isolation to discontinue poorly performing routes. All of the agencies noted that services that consistently perform poorly are subject to monitoring, review and possible action to modify or improve it. Tri-Met has the most aggressive response in its call for poor performing services to be put on probation and evaluated on a continual basis. If efficiency becomes even more urgent in the context of global warming and rising operating costs, Metro may need to consider applying the route performance thresholds and other service evaluation in a more aggressive manner.
- **Guidelines Vary for Types of Service** – It is common for agencies to establish different guidelines for each line of service. Guidelines differed depending upon mode of travel such as bus rapid transit, light rail, and accessible transportation modes but also differentiated between different types of bus service. For example, bus rapid transit was treated differently than local service and peak or commuter services. This approach may be appropriate for Metro as it develops more distinct types of service such as RapidRide.

Issues for Discussion

Many transit agencies have developed guidelines to help track and evaluate performance. Published guidelines or standards can help provide a basis for planners to make difficult decisions when balancing service quality with efficiency. Identified guidelines can assist policymakers and stakeholders in judging whether an agency's actions are consistent and based on established criteria. They can also help ensure consistency across service, service types and facilities. As Metro's system evolves due to initiatives such as Transit Now and fluctuations in the transit market there may be value in updating guidelines to better reflect and guide Metro's service and facility development. In addition, it may be important to establish guidelines to help respond to the emerging issues of climate change, fuel shortages, and increasing demand for transit which suggest that new, innovative approaches to service delivery may be needed to meet demand.

- 1) A “standard” typically establishes a direct link between identified criteria and specific actions, providing consistency but lacking flexibility. Where does Metro need standards?
- 2) A “guideline” typically establishes an indirect link between identified criteria and specific actions, providing flexibility and opportunity for the application of professional and political judgment to dynamic situations and conditions. Where does Metro need guidelines?
- 3) Where should Metro use the emerging best practices and industry standards?

- 4) Should Metro's guidelines be compiled in a single document including annotations of industry documents and sources defining best practices or regulations?**
- 5) What is the right balance between detailed guidelines and simplicity?**

Appendix A: Sample Guidelines for Transit Service Design

The following sample guidelines for transit service design represent some common service planning principles used by Metro. They have been adapted from King County Metro's documents, national industry research and service guidelines used by other transit agencies.

Coverage: The closeness of a transit route to a person's origin or destination is a key factor in choosing to use transit. A suggested standard for bus route spacing is approximately every 0.5 mile in urban, higher density areas, and every 1.0 mile in lower density areas. Closer spacing may be justified where the nature of the terrain discourages pedestrian travel. Adequate and well-maintained sidewalks along with good street lighting encourage transit use. One-quarter mile in flat terrain is the accepted standard for walking access to bus transit; some studies suggest pedestrians will walk greater distances to access more frequent service. General-purpose dial-a-ride service that has flexible routing can be used to expand the coverage of fixed-route service where demand levels, topography, or poor street connectivity restrict fixed-route coverage.

Route travel time: Both absolute travel time and transit travel time in relation to competing modes are factors that influence the choice to use transit. Total transit travel time is influenced by route length, route spacing, service frequency, distance between stops, posted speed limits, traffic congestion, signal timing, and the fare-collection system. Transit routes should be designed to be as short as possible to serve their markets. A maximum travel time of 60 minutes per one-way trip is highly desirable to maximize productivity and maintain acceptable schedule reliability in mixed-traffic conditions.

Directness of travel: Circuitous transit routings are not attractive because they lengthen transit travel times to be more unfavorable in relation to automobile travel. Transit travel times should be no more than 20-25% longer than comparable trips by automobile. As a general rule, bus routes should not serve off-route stops where a significant number of through riders would be delayed. Service should be provided in both directions on the same street wherever possible to maximize customer convenience and service effectiveness. One-way routes, loops, and "snakes" should be avoided when designing bus routes except where required by street configurations or route terminals, since they increase travel times for through riders.

Level of service: The level of service for a bus route can be defined in terms of either the number of trips per hour past a given point, or the frequency in minutes (also called "headway") between bus trips. The two definitions are not necessarily the same for the customer. For example, a route could operate four trips per hour, but not an even 15-minute frequency, if the trips are not scheduled evenly. Service frequency is also an important measure of convenience for transit riders. Either levels of demand for service or policy determine how often transit service operates. "Policy headways" are a quality control tool used by some transit agencies to specify certain service frequencies that maximize customer attraction while meeting a minimum standard of effectiveness. Frequencies of every 30 minutes during weekday rush hours and every 60 minutes during other times are considered minimum thresholds for effective fixed-route service in urban areas.

Span of service: The number of hours per day when transit service is provided along a route, segment of route, or between two locations also plays a role along with frequency and coverage in determining the availability of transit service to potential users. Transit service must be available near the time a trip needs to be made in order for transit to be a travel option. Ideally, transit service should operate according to the standard time periods specified (peak rush hours, midday, evening, etc.) to minimize customer uncertainty. Minimum frequencies, or “policy headways,” can be set by type of route and time period.

Load standards: Load standards are thresholds of the ratio of passengers on board to seats available. Historically, King County Metro’s guidelines provided everyone a seat during non-peak periods and tolerated standees for no longer than 20 minutes during weekday peak hours. In 1987 Metro’s identified *Transportation Service Guidelines* gave the highest priority to alleviating peak loads greater than 1.30, load factors between 1.20 and 1.30 where passengers are standing 20 minutes or longer, and loads between 1.0 and 1.20 during non-peak periods. Peak trips with load factors between 1.0 and 1.20 are the second priority. A full seated load would have a load factor of 1.0. Today, Metro attempts to address any load where passengers are standing 20 minutes or longer, and any passenger load exceeding a 1.20 average load factor.

Route duplication: Operation of more than one route on the same street should be avoided when the routes serve common destinations, except for streets approaching a downtown or urban center, transit center, or park-and-ride facility.

Transfers: Requiring transfers between routes can add to a rider’s total trip time by transit, but can provide increased choice of destinations accessible by transit. Waiting times for changing from one route to another can be minimized by providing frequent service on one or several routes, or by coordinating schedules at certain locations such as transit centers, park-and-ride facilities, or key intersections. One form of schedule coordination is called “timed transfer,” where routes arrive and leave at the same time, with at least a five-minute wait. These recurring waits are known as “pulses.” Routes sometimes can be scheduled to arrive a certain number of minutes before or after the service to which they are connecting. Other, more limited forms of coordination are also used, such as scheduling connections in the predominant direction of travel. Scheduling for timed connections sometimes requires additional buses and service hours.

Turnbacks: On longer transit routes, a turnback (sometimes called a “shortline”) might be used where passenger loads decline sharply, or where ridership cannot justify a higher service frequency. Turnbacks tend to be more common on higher frequency routes operating every 15 minutes or more often, where the potential savings in operating cost from not operating the same frequency over the entire route are greater.

Appendix B: Examples of Service and Facility Development Resources

Service Planning and Implementation

TCRP Report 100: Transit Capacity and Quality of Service Manual

TRB's Transit Cooperative Research Program (TCRP) Report 95: Chapter 9 – *Transit Scheduling and Frequency* http://www.trb.org/news/blurb_detail.asp?id=3747

TRB's Transit Cooperative Research Program (TCRP) Report 95: Chapter 10 – *Bus Routing and Coverage*. http://www.trb.org/news/blurb_detail.asp?id=4045

TRB's Transit Cooperative Research Program (TCRP) Report 30: *Transit Scheduling*. http://www.trb.org/news/blurb_detail.asp?id=2617

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King, R. D. (1998). New designs and operating experiences with low-floor buses (TCRP report 41). Washington, DC: Transportation Research Board.

Levinson, H. S. et al. (2003). Bus Rapid Transit, Volume 2: Implementation guidelines (TCRP report 90). Washington, DC: Transportation Research Board.

Greater Vancouver Transportation Authority (GVTA). 2004b. Transit service guidelines: Technical report and Public summary report. Retrieved April 2007 from

http://www.translink.bc.ca/files/pdf/plan_proj/area_plans/Service_GuideTech_Rep.pdf

http://www.translink.bc.ca/files/pdf/plan_proj/area_plans/Translink_PSR.pdf.

Benn, H. P. (1995). Bus route evaluation standards (TCRP synthesis of transit practice 10). Washington DC: Transportation Research Board.

Transit Route Facilities Development Resources

ADA Accessibility Guidelines for Buildings and Facilities, amended August 2005

APTA Standard Bus Procurement Guidelines (30 ft low floor diesel) – June 28, 2002

City of Bellevue 2004-2015 EIS Transportation Facilities Plan

King County Metro Service Development
Regional Transit Committee June 2008

City of Bellevue Transportation Plan- Bus Stop Facilities

City of Seattle Traffic Codes

Exploring BRT, National Transit Institute – Seattle 2003 for RapidRide

Guidelines for Locations of Bus Stops-TRB, Texas

Low Floor Bus (60ft Diesel-fueled Hybrid PRF Contract King County)

Metro Facility Design Guidelines, 1991

Metro Graphic Standards and Guidelines

Metro Signing Standards Manual

Metro Transit Design and Construction Standards for CAD and Specifications

Metro Transit Signage Standards

Portland Pedestrian Guidelines

Revised Draft Guidelines for Accessible Public Rights-of-Way, November 2005

Sound Transit- Transit Facility Standards and Guidelines- Volume 1 & 2

TCRP Report19, Guidelines for Bus Stops and

Appendix C: Guidelines at Other Agencies

To assess how Metro compares and understand what other agencies do, a literature review and review of plans from other agencies was conducted. The agencies where service guideline documents were available for review included Vancouver TransLink, TriMet of Portland Oregon, Sound Transit and Denver's Regional Transit District (RTD). The review looked at service guidelines and service evaluation.

TransLink – Vancouver, BC, Canada

TransLink, the Greater Vancouver Transportation Authority, is an organization involved in transportation planning and transit service administration. TransLink services include bus service, light rail, ferry and commuter rail.

Service Guidelines:

TransLink provides recommended guidelines that are intended to be flexible targets for the agency and not rigid standards. The recommended set of guidelines exists to meet the objectives of transit service being comfortable, convenient, reliable and frequent. The four category areas for transit service are:

- **Frequency:** Guidelines identify expected frequencies by line of service (express bus, local bus and rapid transit services), running anywhere from every 10 minutes during peak periods to every 30 minutes for express bus services. To optimize transit service and provide sufficient coverage, TransLink states that at least 90% of all residents and employees in urbanized areas should have less than 450 meters (about one-quarter mile) walking distance to a bus stop.
- **Convenience:** Span of service guidelines indicate service beginning no later than 7am and going until midnight or 1am in many cases.
- **Comfort:** TransLink adopts guidelines for maximum passenger standing loads on various coaches during particular service hours. For example, no more than 31 passengers should be standing on an articulated bus that holds a maximum of 85 passengers. Additionally, on 90% of peak period trips, the agency aims to have no customers standing longer than 30 minutes on one bus.
- **Reliability:** The bus reliability service guidelines indicate that 90% of bus trips should not depart more than two minutes late and never early while also not arriving more than three minutes late. Mid-route, 85% of bus trips should depart their timing points no more than three minutes late.

The service guidelines themselves provide a rationale for service allocation and are also employed as a tool for making decisions regarding new service provision and service adjustments. Additionally, TransLink monitors lower performing routes and considers replacing conventional bus services with community shuttle services as the agency sees fit.

TriMet- Portland, Oregon.

TriMet provides light rail, bus service and Downtown Portland streetcar service to the area. The agency has been serving the Portland region for over 35 years.

Service Guidelines:

TriMet first implemented service guidelines in 1989 and has since used these guidelines as a framework for service planning and evaluation. TriMet guidelines focus on a few key areas including minimum service frequencies, schedule efficiency (ratio of revenue to vehicle hours), and bus route spacing. In the service standards document, TriMet identifies policy headways for three types of service: regional/urban routes, city radials, and cross-town routes. Regional and urban routes are defined as those traveling from downtown Portland to suburban transit at a minimum of 10 minute frequencies during the peak period. City radial service into and out of urban neighborhoods into downtown Portland is defined as a minimum peak frequency of 15 minutes. Cross town routes have policy headways of 15 minutes in peak and midday periods and 30 minutes at night.

Service Evaluation:

TriMet also evaluates its low performing lines regularly. Low performing lines are identified using ridership productivity criteria. Routes with less than one-half the bus system average weekly boarding riders per vehicle hour are considered low performing. Low weekly ridership productivity is a starting point for review of the route. Other indicators such as prior reviews and adjustments, other routes serving the area, ridership productivity on nights, the potential for ridership gains and resource savings and the role of the route in providing service to the transit-dependent are also taken into consideration⁷.

The review process for low-performing routes includes involvement from riders, local jurisdictions and other parties interested in participating in the review. TriMet considers a number of actions to increase ridership and productivity on the route. If a decision is made to modify current service, a 6-12 month trial period is set and the service is again reviewed following that date. If the performance of the route has failed to improve, TriMet may propose discontinuation of service. Transit riders, jurisdictions and other parties are given advance notice and time to comment on the changes that TriMet proposes⁸.

Sound Transit – Puget Sound, Washington

Sound Transit, as a provider of regional express bus service, commuter rail and light rail in the Puget Sound area, developed a set of service standards and performance measures for each of its lines of service. Most applicable to Metro's service lines is their regional express bus service guidelines found in Sound Transit's Service Standards and Performance Measures document.

Service Guidelines:

Sound Transit has three main levels of service within their regional bus service: peak, base service and reduced service. Base service is defined as off-peak and midday times, while reduced service is operated mostly at night and later in the evening on weekends. Sound Transit

⁷ TriMet Transit Investment Plan, Fiscal Year 2008. Accessed 9/11/2007.

⁸ IBID.

identifies maximum policy headways of 60 minutes for reduced and base service and 30 minutes for peak service.

Sound Transit also uses a bus stop spacing guideline that limits stops to transit centers, major transfer points and park and ride lots due to the nature of express service. However, an additional standard is that all stops not fitting these characteristics have at least 25 daily boardings.

Service Evaluation:

Sound Transit evaluates service based on a passenger loads, on-time performance, productivity and cost effectiveness. Sound Transit's passenger load guidelines recognize that the average passenger load factor should not exceed 1.0 and this factor should not be exceeded for more than 15 minutes.

On-time performance is reviewed annually to allow Sound Transit to rate performance among routes and prioritize service investments. Routes not meeting identified service levels become candidates for corrective action including frequency reduction, service span revision, route consolidation or deletion. The on-time performance guidelines state that 90% of trips should not depart more than 3 minutes late from the terminus and never early, that 85% of trips should depart mid-route not more than 5 minutes late and 90% of bus trips should arrive at the route terminus no more than seven minutes late.

Route productivity ratings are another tool Sound Transit uses to evaluate performance on an annual basis. The three performance indicators include boardings per revenue hour, boardings per trip and purchased transportation cost per boarding. The measure of purchased transportation cost per boarding is unique to Sound Transit since the agency pays partner transit agencies including Metro for bus operations and maintenance.

There are four productivity and effectiveness ratings for ST express routes: Good, Satisfactory, Marginal and Unsatisfactory. A good rating constitutes service performance at 125% or more of system average in passengers per trip and passengers per revenue hour and a 75% or less of the system average in purchased transportation cost per boarding. Those routes identified as marginal or unsatisfactory undergo a more detailed service evaluation process. Routes that maintain this rating for a period of two years or more become candidates for marketing programs, selective deletion of route segments or complete restructuring. Those routes that achieve a good or satisfactory rating are considered for service enhancements as resources become available.

Regional Transit District - Denver, Colorado

The Regional Transportation District employs a three-tiered system that involves service standards, quarterly reports and a management report. Performance measures and standards are identified for seven service classes including local urban, local suburban and express routes. The

quarterly report addresses measures such as complaints and schedule adherence while there is a set of economic indicators employed as part of the service standards and performance review.

RTD service standards are incorporated into the service performance report and provide the minimum guidelines. Routes are expected to meet the 10% minimum for subsidy per boarding and boardings per hour as defined by their service class. For example, Express routes are expected to operate with a maximum of a \$15.59 per passenger subsidy and a minimum of 11.5 boardings per hour. When services fall below, they are evaluated for marketing, revision or elimination. Routes that perform minimally get minimum service frequency, typically every 30 minutes during peak periods and 60 minutes in the off-peak period. RTD has also identified minimum requirements for boardings per hour for both 15 minute and 10 minute frequencies for each of the service lines including